

universe

J e t P r o p u l s i o n L a b o r a t o r y

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the
e A R T H

JPL instrument carried into Earth orbit

By Alan Buis

*Aqua, carrying JPL's
Atmospheric Infrared
Sounder, launches from
Vandenberg Air Force
Base May 4. At right are
AIRS Project Manager
Dr. Avi Karnik(left) and
science team leader
Dr. Moustafa Chahine.*



NASA's latest Earth-observing satellite, Aqua, carrying the JPL-managed Atmospheric Infrared Sounder (AIRS) instrument, successfully launched Saturday, May 4 at 2:55 a.m. Pacific time. Aqua is dedicated to advancing our understanding of Earth's water cycle and our environment.

THE SPACECRAFT LIFTED off from Vandenberg Air Force Base, Calif., aboard a Delta II rocket. Spacecraft separation occurred at 3:54 a.m. Pacific time, inserting Aqua into a 705-kilometer (438-mile) orbit.

"The Aqua project has truly been a team effort and we are very excited this morning," said Aqua project manager Phil Sabelhaus at NASA's Goddard Space Flight Center, Greenbelt, Md.

The primary goal of Aqua, as the name implies, is to gather information about water in Earth's system. Equipped with six state-of-the-art instruments, Aqua will collect data on global precipitation, evaporation and the cycling of water. This information will help scientists all over the world to better understand Earth's water cycle and determine if the water cycle is accelerating as a result of climate change.

JPL's AIRS will measure Earth's atmosphere and surface, allowing scientists to improve weather prediction and observe changes in Earth's climate. Aqua will circle the globe almost 15 times a day in polar orbit, with AIRS observing and characterizing the entire atmospheric column from the surface of Earth to the top of the atmosphere. The instrument will provide data on surface emissivity and temperature, atmospheric temperature and humidity, cloud cover and height, and spectral outgoing infrared radiation. It will also measure ozone and other greenhouse gases. These data will help researchers increase their understanding of Earth's global water and energy cycles, climate variation and trends, and the response of the climate system

to increased greenhouse gases. The results will be improved weather forecasts, better understanding of factors influencing climate prediction and air quality, and better ability to reduce economic and human losses from weather-related hazards.

AIRS will help fill a void in current weather and climate observations, as two-thirds of the precipitation on land comes from the 75 percent of the world covered by oceans. Weather balloon data provides most of the information about Earth's atmosphere, with about 4,000 "radiosonde" balloon launches each day. AIRS, however, will provide 100 times the coverage balloons do, including over the oceans, which weather balloons do not observe.

Three NOAA scientists on the AIRS science team will analyze data in support of weather-forecasting, and AIRS Data from will be provided to the National Oceanic and Atmospheric Administration within three hours. Data for climate research purposes are received, analyzed and archived at Goddard Space Flight Center within 72 hours," said AIRS Project Scientist Dr. George Aumann. The AIRS science team provides the algorithms for data analysis. Implementation of the science algorithms is carried out in Division 38 under Steven Friedman and data validation is carried out in Division 32 by a science team lead by Dr. Mike Gunson.

Aqua is the latest in a series of Earth Observing System spacecraft, following the Terra satellite launched in December 1999. Aqua will cross the equator daily at 1:30 p.m. as

it heads north. The early afternoon observation time contrasts with the Terra satellite, which crosses the equator between 10:30 and 10:45 a.m. daily. Aqua's afternoon observations, combined with Terra's morning observations, will provide important insights into the daily cycling of key scientific parameters such as precipitation and ocean circulation.

Aqua is a joint project among the United States, Japan and Brazil. The United States provided the spacecraft and four of the six scientific instruments. In addition to the JPL-provided Atmospheric Infrared Sounder, the other U.S. instruments include the Moderate Resolution Imaging Spectroradiometer and the Advanced Microwave Sounding Unit, both provided by the Goddard center, and the Clouds and the Earth's Radiant Energy System, provided by NASA's Langley Research Center, Hampton, Va.

Japan's National Space Development Agency provided the Advanced Microwave Scanning Radiometer, while the Instituto Nacional de Pesquisas Espaciais (the Brazilian Institute for Space Research) provided the Humidity Sounder for Brazil.

For more information, visit the Aqua website at <http://aqua.nasa.gov> and the AIRS site at <http://www.jpl.nasa.gov/airs>.



Photo by Bob Brown / JPL Photolab

Mom, dad bring their children to work

More than 700 youngsters dropped by the Lab Thursday, April 25 for "Bring Your Child to Work" day, JPL's version of the national "Take Our Daughters to Work" day. Left, a Mars rover makes its way over visitors, and below two boys set sail their "straw rockets." Besides having free rein to shadow their parents in their laboratories and offices, the children also enjoyed presentations by JPL scientists, engineers and technologists. The day was sponsored by the Human Resources Division, Diversity Programs Office, Advisory Council for Women, Advisory Committee on Minority Affairs and New Professional Network.



Photos by Bob Brown / JPL Photolab



News Briefs

JPL takes the reins on Jason 1

Jason 1's oceanography mission to monitor global climate interactions between the sea and atmosphere reached another major milestone in late April with the successful handover of day-to-day operations from the French Centre National d'Etudes Spatiales to JPL.

JPL is now responsible for around-the-clock real-time monitoring of Jason 1's health and status, and for generating and uploading weekly stored command sequences to the spacecraft for mission planning, payload commanding, navigation, ground station acquisition and routine maintenance.

The French Space Agency's Satellite Control Center in Toulouse, France, will continue to perform spacecraft engineering and navigation tasks. Both organizations will be jointly responsible for processing mission science data.

"Jason's measurement performance to date has been excellent," said DR. LEE-LUENG FU, Jason project scientist at JPL. "The early mission phases have been very smooth. This success is due in large part to the hard work and outstanding cooperation between the U.S. and French teams, who continue to work together to leverage experience and efficiencies gleaned from a decade of joint Topex/Poseidon operations. We look forward to continuing to work with the French to establish routine mission operations."

Lab would support Pluto mission

At the request of the New Horizon principal investigator, JPL will provide deep-space navigation design and support for the mission to Pluto if the mission is approved to proceed to the

implementation phase.

"JPL is the premier organization in the world for deep-space navigation and therefore it is frequently asked to provide this capability to principal investigator-led missions," said DR. FIROUZ NADERI, director for JPL's Solar System Explorations Programs Directorate. A recent example of this, he pointed out, was JPL leading an award-winning navigation team to successfully land Applied Physics Laboratory's NEAR Discovery mission on the asteroid Eros.

Blood drive coming up

The next JPL/Red Cross Blood Drive will be held in von Kármán Auditorium May 14 from 10 a.m. to 4 p.m. and May 15 from 7 a.m. to 1 p.m.

Sign-up sheets will be available at Occupational Health Services, Building 310-202, and at their home page, http://eis/medical/blood_form.html.

Last-minute signups, may go directly to von Kármán at their preferred time. Be prepared to wait a little longer if you do not have an appointment.

To change an appointment, call the Pasadena Red Cross at (626) 929-4151. For questions regarding donations or eligibility, call Red Cross nursing personnel at (800) 843-2949, ext. 5521, or visit <http://www.sgvarc.org>.

JPL Occupational Health Services said the Red Cross collected 164 pints of blood during the Feb. 19-20 blood drive on Lab, and 492 lives will benefit from that collection. OHS added that the Red Cross is currently experiencing a critical shortage of all types of blood, especially the O negative type, and their inventory continues to remain below desired levels.

As part of the Level A Bonus Awards in February, four JPL scientists have received the 2001 Edward Stone Award for Outstanding Research Publication.

This new award, issued by the Office of the Chief Scientist, recognizes and encourages publication of significant research results in science and in technology by JPL employees throughout their professional careers. It is named in honor of former JPL Director Dr. Edward Stone, who led JPL from 1991-2001.

The recipients are: Gerhard Klimeck, Section 381, for "Off Zone Center or Indirect Bandgap-Like Hole Transport In Heterostructures," *Physical Review B*, Volume 63, 2001.

William Read, Section 3272, for "UARS Microwave Limb Sounder Upper Tropospheric Humidity Measurement: Method and Validation," *Journal of Geophysical Research*, in press.

Following are other Bonus Award winners, as selected by JPL's Compensation Advisory Subcommittee, for accomplishments that had Labwide impact. Honorees received their awards in March for either Outstanding Accomplishments or Outstanding Leadership.

Issued by Office of the Director: Kimberly Simpson, Section 470; Arthur Murphy Jr. (134); Neil Yarnell (310).

Issued by Business Operations and Human Resources Directorate: Domingo Dongon Jr. (2724), Thomas Lynch (2613), Richard Hann (241), Debra Giles-Zemitis (2124), Vivian Pahati (2151).

Issued by Engineering and Science Directorate: Ernesto Rodriguez (334), Dr. William Banerdt (3236), Mark Dragovan (3231), Marc Foote (386), Dr. Bobby Williams (312), Dr. Karen Buxbaum (354), Donald Sevilla (352), Gary Glass (336), Randall Bartman (383), Timothy Munson (335), Emily Law (369).

Issued by Planetary Flight Projects Directorate: Chester Sasaki (480), David Spencer (410), Roger Gibbs (410), Robert Mase (312), Carl Kloss Jr. (313), Guy Beutelschies (313).

Issued by Office Of Safety and Mission Success: Khanara Ellers (510).

Issued by Solar System Exploration Programs Directorate and Mars Exploration Program Office: Sarah Gavit (620), Curt Henry (313), John Brophy (353).

Issued by Astronomy and Physics Directorate: Daniel Coulter (713), Amit Sen (387).

Issued by Earth Science and Technology Directorate: Yunjin Kim (802), Gary Kunstmann (840), Avinash Karnik (877), Ronald Ross Jr. (354.)

Issued by Interplanetary Network Directorate: James Border (335).

To learn more about the Bonus Award program, visit <http://eis/sec614/reward> and click on "Bonus Awards" in the "Recognition" section.

Special Events Calendar

Ongoing Support Groups

Alcoholics Anonymous—Call the Employee Assistance Program at ext. 4-3680 for meeting time and location.

Codependents Anonymous—Meets at noon every Wednesday. Call Occupational Health Services at ext. 4-3319.

Gay, Lesbian and Bisexual Group—Meets the first and third Fridays of the month at noon in Building 111-117. Call the Employee Assistance Program at ext. 4-3680 or Randy Herrera at ext. 3-0664.

Caregivers Support Group—Meets the first Thursday of the month at noon in Building 167-111 (The Wellness Place). For more information, call the Employee Assistance Program at ext. 4-3680.

Working Parents Support Group—Meets the third Thursday of the month at noon in Building 167-111 (The Wellness Place). For more information, call the Employee Assistance Program at ext. 4-3680.

Friday, May 10

Brazil: Giant of the South—This travel film will be shown at 8 p.m. in Caltech's Beckman Auditorium. Tickets are \$9 and \$7. Call (626) 395-4652.

Presentation on Stress and Anxiety—Dr. Charles Barr, a psychologist in private practice in Pasadena, will discuss available treatment at noon in von Kármán Auditorium. For questions, call the JPL Employee Assistance Program office at ext. 4-3680. For more information on anxiety, visit <http://www.nimh.nih.gov/anxiety/anxietymenu.cfm> or <http://www.freedomfromfear.org>.

Von Kármán Lecture Series—Mars Odyssey Project Manager Roger Gibbs will present "The Odyssey to Mars" at 7 p.m. at Pasadena City College, 1570 E. Colorado Blvd., Building C, Room 333. Visit the von Kármán Lecture Series website at <http://www.jpl.nasa.gov/events/lectures/may02.html> or call Public Services at ext. 4-0112.

Saturday, May 11

Bandorama—The Caltech Jazz and Concert Bands will perform a program to be determined at 8 p.m. in Beckman Auditorium. Admission is free. Call (626) 395-4652.

Folk Music—Singer/songwriter James Lee Stanley will appear at 8 p.m. in Caltech's Dabney Lounge. Tickets are \$12 for adults, \$4 for children under 12. Call (626) 395-4652.

Tuesday, May 14

JPL Stamp Club—Meeting at noon in Building 183-328.

TIAA/CREF Workshops—"Taking A Realistic Look At Equity Returns," from 10 a.m. to noon, will focus on a better perspective on equity performance that should help tune out the fund choice "noise" and discuss how to best meet your financial goals. "A Woman's Money, A Woman's Future," from 1 to 3 p.m., will offer tips and tactics on investment basics and portfolio building by selecting the best products for meeting your financial goals. Both workshops will be held in Building 180-101.

Thursday, May 16

Working Parents Support Group—Dr. Linda Povernny will present "Children and Drugs: Symptoms and Strategies" at noon in Building 167-111. Povernny, who specializes in crisis intervention and providing treatment for substance abuse, is a former faculty member of the USC School of Social Work. For more information, call JPL's Employee Assistance Program at ext. 4-3680.

TIAA/CREF Enrollment Meeting—Employees newly eligible for Caltech/JPL retirement plan participation can come to Building 180-101 at noon for assistance in selecting investment op-

tions and completing enrollment forms.

Wed.-Thu., May 14-15

Investment Advice—TIAA/CREF will offer one-on-one counseling in T-1720. For an appointment, call (877) 209-3140, ext. 2614.

Sunday, May 19

Pasadena Young Musicians Orchestra—While the 90-member group performs excerpts from Gustav Holst's "The Planets," JPL will present a multi-media show that will focus on the Mars, Jupiter and Venus portions of Holst's work. JPL is participating in the community outreach event as part of a year-long celebration of the 40th anniversary of the first spacecraft to another planet, JPL's Mariner 2. To be held in Pasadena City College's Sexson Auditorium, 1570 E. Colorado Blvd., starting at 4 p.m. For more information, call (626) 797-1994 or visit <http://www.pymo.org>.

Tuesday, May 21

Investment Advice—Fidelity Investments will offer one-on-one counseling in T-1720. For an appointment, call (800) 642-7131.

JPL Hiking+ Club—Meeting at noon in Building 238-543.

Wednesday, May 22



"Einstein at Caltech: Publishing the Collected Papers of Albert Einstein"—Dr. Diana Buchwald, professor of history and editor and director of the Einstein Papers Project at Caltech, will lecture at 8 p.m. in Beckman Auditorium. Free admission. Call (626) 395-4652.

JPL Toastmasters Club—Meeting at 5 p.m. in the 167 conference room. Guests welcome. Call Joy Hodges at ext. 4-7041 for information.

Thursday, May 23

Award for Excellence Ceremony—To be held at 1 p.m. on the mall. Limited seating. For more information, see the Employee Services and Recognition website, <http://eis/sec614/reward>.

Caltech Architectural Tour—The Caltech Women's Club presents this free service, which is open to the public. The tour begins at 11 a.m. and lasts about 1 1/2 hours. Meet at the Athenaeum front hall, 551 S. Hill St. Call Susan Lee at (626) 395-6327.

JPL Stories—Marc Montgomery, manager of the Institutional Business Systems Division and the New Business Systems Project, will present "Automated Business Systems: The Myth, Mystery, and Magic" at 4 p.m. in the Library, Building 111-104. For questions about the story series or participation information, call Teresa Bailey at ext. 4-9233.

Saturday, May 25

The Race for Our Future—Building Bridges, a Caltech community service organization, is sponsoring this fundraiser for college scholarships that will support two promising students at Blair High School. Races vary in length from 100 to 5,000 meters and will be held, rain or shine, at the Caltech track and North Field. To participate and/or make a donation to the scholarship fund, visit <http://bbridges.caltech.edu/race.html> and send the appropriate form to the address posted. Signups are due May 17. Call (626) 676-1666.



Photo by Carol Lachata / JPL Photolab

From left: Dr. Tom Prince, Eric Rignot, William Read, Gerhard Klimeck, Dr. Edward Stone. Not pictured is Gerard van Belle.

Eric Rignot, Section 334, for "Penetration Depth Of Interferometric Synthetic-Aperture Radar Signals In Snow And Ice," *Geophysical Research Letters*, Volume 28, No. 18, Sept. 15, 2001.

Gerard van Belle, Section 383, for "Altair's Oblateness and Rotation Velocity from Long-Baseline," *Astrophysical Journal*, Oct. 1, 2001

Up to four awards in this category will be given each year. In return, each recipient will be asked to give a public lecture to the JPL community related to the work for which she/he is being recognized. The lectures will be spread through the year.

ONE YEAR LATER

DR. CHARLES ELACHI ON MAY 1 MARKED THE FIRST ANNIVERSARY OF HIS TENURE AS JPL DIRECTOR. HE DISCUSSES THE PAST YEAR AND PROSPECTS FOR THE COMING YEAR WITH UNIVERSE.

BY MARK WHALEN

has the year seemed to go by quickly?

Yes. It's amazing how time goes by when you're enjoying what you're doing. It's been a busy year, but also a rewarding one, for me and I think for the Lab as well. Clearly, the successes of the last year speak for themselves—Mars Odyssey going into orbit, the Deep Space 1 flyby of Comet Borrelly and the successful launches of Genesis, Grace, Jason and AIRS—are a result of all the hard work of our employees. This shows in the morale at the Lab as well as outside perceptions of JPL.

What do you feel has been the most significant thing that has happened for you and the Lab in the last year?

The one thing I'm particularly proud of is the improved communication between employees and senior management. I believe that employees now better appreciate some of the challenges senior managers have, and senior managers have become more aware of and proactively addressing issues important to employees.

One thing I can assure people about is that each and every comment I get in my meetings with employees is discussed and acted on. That doesn't mean it satisfies everybody, but each comment is taken very seriously and is explored to see if we can have a better environment for the employees to excel in their work.

What are some top-priority issues senior management is working right now?

One key thing is the investment we are now able to make in long-term research. NASA has agreed to allow JPL to have a Research and Technology Development Program, for which we can invest up to 3 percent of our budget each year. This is our investment in the future and to keep our leadership in space and Earth exploration.

We've also significantly increased the funding for our technical infrastructure. This area will take a few years of increased funding to address our needs and keep us at the leading edge.

Another thing employees indicated they wanted a year ago had to do with job grades. There are now two senior levels, and we have also established a fellows grade, which will allow engineers, scientists and researchers to get to the level of a division manager without actually becoming a manager.

In almost every area I discussed a year ago, we have taken some positive steps. A couple of examples: The new JPL Rules! website that replaced DMIE is streamlined and easier to access, and many documents have been simplified or eliminated. Another challenge I gave myself was to regularly meet with all employees; I am now doing that and also meeting with all section managers every quarter,

tors at Headquarters. I actively participated in defining that vision and I'm fully aligned with it.

One key part of the vision is understanding and protecting our planet; I would expand that to include protecting our way of life. That encompasses understanding how weather, climate and our environment are changing, how natural hazards may affect our lives, and applying the science and technology that NASA has developed to better understand the changes in our environment and thus better our lives. And that's clearly an area where JPL is, and will continue to be, a major player.

The next major area of the NASA mission is "to explore the universe and search for life." That's one of the most exciting intellectual endeavors that humans can do—understanding where we come from, where are we going, and whether or not we are alone in the universe. This is also an area in which we have played and will continue to play a major role, in both our planetary and astrophysics programs.

The third one—nurturing the next generation of explorers—encompasses not only explorers. I know that Sean O'Keefe feels very strongly about investing in and strengthening science and engineering education in this country, because this is the foundation that led to the economic growth of our nation, and is critical for future growth. I am fully aligned with this goal and we will continue to expand our education and outreach activities to help in this area.

If 10 years from now we can look back and say we've accomplished these three missions, I think the nation will continue to be proud of NASA and feel that is a critical and essential part of our government.

Recently, the Executive Council went on a retreat. Any news to report from that series of meetings?

There were two key things we focused on. First, we are living in a more competitive environment, one that creates a new level of energy and imagination. I think we should espouse it fully. We have always fared well in such an environment—more than half of our current missions, and those in development, have been won competitively—and we have always been in competition in the area of instrument development and scientific research.

We might not win each and every competition, but I'm confident that we will continue to fare extremely well and have a vibrant organization and exciting work in the future.

The second key objective we discussed in the retreat is that we at JPL are perceived as being world-class at what we do. However, we need to do a better job in how we do things, particularly in the financial area. I want JPL to be a model of technological innovation as well

"I SEE THE EXCITEMENT IN THE EMPLOYEES' EYES. EVERY EMPLOYEE FEELS THEY WANT TO CONTRIBUTE TO OUR NATION'S QUEST OF EXPLORATION, AND THAT MAKES JPL A VERY SPECIAL PLACE."

and group supervisors every six months. I enjoy this tremendously because I learn a lot and get a first-hand assessment of the state of the Lab.

Shortly after taking office, you reorganized the Executive Council, and also created the new management councils. Has this worked out well?

We have a first-rate Executive Council team that I am confident will lead the Lab very successfully in the coming years. The management councils we established are also allowing a broader engagement of employees into decision-making. Each management council has members from outside the EC, some of whom are engineers, scientists, and program managers or project managers.

The system is working well so far, but it's early in the process. I feel good about this arrangement and we intend to continue the management councils for the foreseeable future.

Last month, NASA Administrator Sean O'Keefe outlined a new strategic vision for NASA. What is your opinion of that vision, and where does JPL fit in?

The vision O'Keefe laid out for NASA came out of a series of meetings with all NASA center directors and all the enterprise associate administra-

as management innovation.

So we have decided to create senior positions of deputy project managers for resources, so that we can pay the same kind of attention to the business side as we do the technical side. We will make sure there are career paths for this type of work, that we actively encourage professionals who have experience in finance and resource management, that we nurture our employees and provide training for those who want to acquire this kind of talent.

In my mind, a successful project is when you have very close teaming between the project manager, project scientist and financial resource manager. I have no doubt we can do this and be a model for other organizations.

What are the Lab's biggest challenges over the next 12 months?

We need to make sure we have successful launches, within budget, of Gallex, SIRTf and the two Mars Exploration Rovers. At the same time, we need to make sure that all our activities are successfully implemented within the resources that we committed to.

I'm particularly proud that we have a first-rate team, JPL employees have tremendous talent and integrity, and people here strive for excellence. I see the excitement in the employees' eyes. Every employee feels they want to contribute to our nation's quest of exploration, and that makes JPL a very special place.

I'm optimistic that the next 12 months will be just as exciting and rewarding for all of us as were the last 12 months, and I look forward to celebrate with all the employees our future accomplishments.



Photo by Dutch Slager / JPL Photolab

Tech contributors receive cash awards

By Mark Whalen

DailyPlanet
online for the JPL community

Classified ads will be available the day before Universe is published, at <http://dailyplanet>

JPL's online news source

View this and previous issues of Universe online <http://universe.jpl.nasa.gov>

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Notice to Advertisers

Advertising is available for JPL and Caltech employees, contractors and retirees and their families. No more than two ads of up to 60 words each will be published for each advertiser. Items may be combined within one submission. Ads must be submitted on ad cards, available at the ERC and the Universe office, Bldg. 186-118, or via e-mail to universe@jpl.nasa.gov. Ads are due at 2 p.m. on the Monday after publication for the following issue.

All housing and vehicle advertisements require that the qualifying person(s) placing the ad be listed as an owner on the ownership documents.

JPL held ceremonies last month to honor individuals who contribute outstanding scientific or technical inventions or patents that are sponsored, adopted, supported or used in support of NASA's mission.

At the April 17 event, JPL Director Dr. Charles Elachi honored recipients of Space Act awards, which are issued by the NASA Inventions and Contributions Board. About 60 JPL individual employees and contractors, and team members, received a total of about \$100,000.

Dr. Karina Edmonds of JPL's Strategic Intellectual Assets Management Office said that since Caltech patents are not eligible for the NASA patent award, the Inventions and Contributions Board considers for Space

Dr. Sarath Gunapala, left, and John Liu received the Inventions and Contributions Board's Exceptional Awards at April 17 ceremonies.

Photo by Bob Brown/JPL Photolab

Passings

ARTHUR GUSSNER, 54, a senior engineer in Section 513, died of pulmonary fibrosis April 13. Gussner had worked at the Lab since 1985. He is survived by his wife, Jill; daughter Wendy, son Tony and two grandchildren. Burial services were private.

THOMAS LEAR, 71, a retired member of the technical staff in Section 344, died of undetermined causes April 17. Lear joined JPL in 1956 and retired in 1995. He is survived by his sister, Kathleen, and brother Joel. Memorial services were held April 28 at Cabot & Sons in Pasadena.

WILLARD VAUGHAN, 87, a retired carpenter from Section 662, died April 18. Vaughan worked at the Lab from 1956-77. He is survived by his wife, Lena; four children, eight grandchildren and seven great grandchildren. Services were private.

Letters

Thank you to all my co-workers for their support following the recent death of my wife's mother. Thank you also for the lovely plant.

Dan and Carolyn Snyder

I would like to thank my many friends and co-workers for expressions of support during the extended illness and the passing of my father-in-law. Linda and I are especially grateful for your understanding of the need for repeated absences from the Laboratory. Linda joins me in thanking the ERC for the beautiful plant sent to our home.

Milton Lavin

Classifieds

For Sale

BABY ITEMS: front carrier, Evenflo, soft, \$7; rear carrier Gerry, hard, \$25; bathtub, Gerry, plastic, \$5; activity gym, Infantino, overhead, \$7; car seat w/base, Century, rear-facing, \$40; bathtub carousel, Safety1st, \$7, all in superb cond., prices are obo. 626/791-6101. BABY ITEMS: Simons crib, changing table, high chair, bath, playpen, monitor, etc., all best offer. 626/355-9651. BARBIES: Bob Mackie Fantasy Goddess of The Americas \$125, Mackie Arctic \$150, Faberge Imperial Grace \$195, Enchanted Mermaid \$175, Venetian Opulence \$90, AA Cinnabar Sensation \$75, Nolan Miller Evening Illusion \$75, Vivien Leigh GWTW Scarlet BBQ or Drapes \$50, In The Pink Fashion Model \$125, Elizabeth Taylor, White Diamonds \$70 + more, for list www.thevintagekidcollection.net, telicone@yahoo.com. BED, antique oak & rod iron queen-size w/rails, see picture at JPL Store, \$175/obo. 626/744-9064. CAMCORDER, Sony compact, hi-res, Hi-8 type, model CCD-TR81, remote, carry case, 8 tapes, works well, \$225. 687-8627. CART, by Huge Cart, folds flat, brand new, \$35/obo. 626/791-6101. CHINA CABINET, 1950s Drexel mahogany, for photo: lelson@bigfoot.com, \$500 cash and carry. 353-9367. COMPUTER, Apple G3/ 233MHz, 32MB, 4GB HD, 24x CD-Drive, OS 8.5, Apple 15" monitor \$300/obo. 626/229-9953.

Act awards eligibility any contribution that leads to a Caltech non-provisional patent or patent filing.

The process begins when technologists report new technology by filling out forms for patents or software at the JPL Intellectual Assets Office website at <http://ip>. The deadline for the next round of award eligibility begins May 20.



\$6,000. 626/447-6423. '93 FORD Escort wagon, white, orig. owner, 5 spd., exc. cond., 1.9L, a/c, pwr. steering/mirrors, roof rack, am/fm/cass, 101K mi., \$2,700. 790-8760. '91 FORD Explorer XLT, white, exc. cond., must sell by May 20, \$4,000. 626/445-4936. '87 FORD F-250 PU, 460cid V8, 4:10-1 Diff. auto, A/C, AM/FM, PS/PB, cruise, new tires, 5th wheel hitch/bed cover, 43K mi., good cond., strong tow veh., records available, renewed lic.-Jan., cab top air foil, \$5,500. 626/963-5727. '92 HONDA Accord EX, sedan 4 dr., 106K mi., gd. cond., white w/blue int., auto., 4 cyl., 2.2 ltr., front whl dr., a/c, p/s, p/w, p/dl, cruise cont., ABS, tilt whl., sun/moon roof, am/fm stereo/cassette, anti-theft, gd. tires, \$5,800. 626/296-9073, Pati. '91 HONDA Accord LX, 4 dr., 167K mi., black, auto, a/c, p/s, p/w, p/dl, cruise cont., am/fm/cass., exc. engine, body and int. cond., \$3,900/obo. 310/313-0284. '85 COUNTRY LITE 5th wheel trailer, 30 ft., orig. owner, alum. frame, 13.5K, A/C, side ba., microwave, TV/VCP avail, new tires/water pump, slps 6, exc. cond., renewed lic.-Mar., \$8,500. 626/963-5727. '91 OLDSMOBILE Silhouette mini-van, ~140K mi., good cond. \$3,400. 957-3675. '93 SAAB 9000 CDE, 4-dr. sedan, 5 spd., 72,500 miles, citrin beige, metallic w/tan leather interior, genuine wood dash, loaded, 1 owner, pwr. everything, AM/FM/cassette/in-dash CD/7-band equalizer, clean car, no smoking/eating/drinking/ children/pets, good cond., new clutch, radiator, and water pump in last 6 mo., sell \$680 below Kelley Blue Book, \$6,900. 626/794-2965. '94 SATURN, 4 dr., 5 sp., ~150K miles, fair cond. \$1,950. 957-3675. '97 TOYOTA Camry LE, auto, 57,800 mi., white w/gold trim, alloy wheels, moonroof, great cond., \$11,000/obo. 626/290-1970. '93 TOYOTA Camry LE, 84K mi., 4-cyl, dark blue, exc. cond., ABS, alloy wheels, a/c, p/s, p/w, p/dl, cruise, tilt str whl, am/fm stereo cassette, new tires, \$6,500 626/577-0068. '89 TOYOTA Camry, sedan, 4 dr., automatic, 1 owner, A/C, front wheel dr., 4 cyl., 2.0L, good cond., clean, \$3,200/obo. 626/282-1821. '00 VOLVO S40, leather, CD, auto, spoiler, loaded, moonroof, salvage title history, 21,000 mi., \$13,500. 909/599-3230. '00 VOLVO S80, auto, heated leather power seats, moonroof, 20K mi., CD, loaded, salvage title, \$19,995. 909/599-3230.

Wanted

GUEST HOUSE/DUPLEX in safe, quiet neighborhood for single female, prefer no more than 15 minutes from JPL, one or two bedrooms/den, bath, kitchen w/stove. 541-9210, Fran. HOUSEKEEPER, part-time, light housekeeping/ child care, weeknight evenings and weekends, La Canada, \$9/hr. 790-1893. HOUSING, for visiting professor & family, mid-June thru early-Sept., near JPL, Caltech, or public transportation preferred. knickels@trinity.edu. SPACE INFORMATION/memorabilia from U.S. & other countries, past & present. 790-8523, Marc Rayman. WALKERS/SPONSORS for California Liver Walk on June 1 at Griffith Park; will join thousands working to raise dollars to help find a cure for hepatitis and other liver diseases. 626/355-1765, Holli Leonard.

Free

CAT, female gray, rescued from a car lot, very friendly, 1 year old, litter trained, groomed, spayed, does not like dogs. 626/287-9433. FUTON, single mattress w/spare cover & wooden frame (ikea); COMPUTER DESK, L-shaped (needs assembly); small glass shelf. 626/398-6419. MULCH, good for covering weeds, Fire Dept. approved, works great in gardens, makes terrific compost, free delivery to local JPL area, have tons. 626/798-6405, after 6 p.m.

For Rent

ALTADENA, furnished garage apartment newly remodeled with new appliances, 1 bd., 600 sq. ft., utilities paid, quite neighborhood, short-term lease preferred, non-smoker, no pets, \$850. 626/791-0317. ALTADENA, 1-bd. guesthouse, fenced yard, secure, clean, quiet, Florecita area above E. lot, walk to JPL, avail. 6/1, \$495 + 1/3 utilities, \$600 sec. dep. 626/794-6076. ALTADENA, 3 bd., 2 ba., private family home, fireplace, remodeled kitchen and bath, 2-car garage, laundry, spacious back yard, great view, gardener included, \$1,500. 909/392-7554. ALTADENA house, charming 2 bd., 1 ba., near Christmas Tree Lane, hardwood floors, fireplace, appliances, fenced backyd, fruit trees, roses, incl.

Edmonds said the Inventions and Contributions Board determines award amounts, which range from \$500 to \$100,000. Awards are guaranteed to contributors whose innovations have been published in NASA Tech Briefs (\$350 per author); for software that has been approved for release to qualified users (\$1,000 for a sole author, \$500 each for multiple authors), or inventions have received approval for patent application by NASA (\$1,000 for a sole inventor, \$500 each for multiple inventors).

Since NASA's inception in 1958, the Inventions and Contributions Board has issued more than 79,000 awards to NASA and its contractor employees—as well as to other government, university and industry personnel—totaling more than \$27 million.

For more information on the NASA Inventions and Contributions Board, visit <http://icb.nasa.gov>. Visit the Intellectual Assets Office website for a list of this year's JPL Space Act Award recipients.

water, gardener, trash; see www.alumni.caltech.edu/~chrisc, \$1,650/negotiable. 626/794-9579. CRYSTAL VIEW, 1 bd., guesthouse, on .75 acre, very private, rose garden, patio, fruit trees, Direct TV, car port, \$875 includes util. 352-6778, Ann. GLENDALE, unfurn. bd., share ba. in roomy 2 bd., 1 ba. home, full house privileges, laundry, garage, yard, quiet neighborhood, 15 min. to JPL, no pets, no smoking, female preferred, avail. June 1, \$625 + 1/2 util. 507-5632. LA CANADA/FLINTRIDGE, room, private ba., kitchen privileges, BBQ, pool, parking, 2 mi. from JPL. 790-1280. LA CRESCENTA homette, furnished bd., kitchen privileges, all linens provided and washed, TV included, no pets, month-to-month, 7 mi. from JPL, \$600 + deposit. 951-0455. MONTROSE, detached bachelor apt., 10 min/JPL, \$525. 626/445-0884. PASADENA apt., share 2+2-loft in luxury security complex near Colorado and Lake, living room and kitchen fully furn., DSL/balcony/pool/Jacuzzi/gym, \$750. 626/644-5431. PASADENA, furn., 2 bd., 1.5 ba., townhome-style apt., a/c, parking, patio, laundry facilities, no pets, great for co-ops, \$1,195 util. 626/351-9641. PASADENA, furnished apartment to share, 2 bd., 1.5 ba., a/c, parking, patio, laundry facilities, no pets, \$595/each, plus utilities. 626/351-9641. PASADENA, spacious 2-story condo, 3 bd., 2.5 ba., prestigious community, beaut. inter., bright ktch., prof. landscape, ctrl. air & heat, close to shop., cozy 1/2 with f/p, end unit, frml d/r, hdwd. flrs., immac. cond., close to schls. \$1,750. 626/396-9024.

Real Estate

COLORADO, 10+ level acres nr. Rio Grande, N.M. border, two adjacent, 5-acre lots on St. Hwy 248, sell one or both for \$1K/acre/obo. 626/254-1550. SHOW LOW, Ariz., 3 bd. house, .43 acres w/ ponderosa pines, nat'l gas, sewer, in town subdivision, close to skiing and fishing, great investment property, house nds. help. \$30K/obo. Randall.Mielke@fijivillage.com. SILVERLAKES, Calif., resort, golfer's dream, 4 wks free golf anytime each year, vac. club membership, 2 bd. condo for up to 6 people, 2 lakes, many amenities, private PGA-rated course w/driving range/putting greens, less than 2 hours/Pasadena, exchange rights w/3,000 resorts, re-duced to sell due to illness, \$16,500. 805/967-7725. WILLIAMS, Ariz. area, (10 mi. away), 85 acres w/2-rm house, seasonal pond, wildlife everywhere, house on top of cliff w/great views, 4-mi. dirt road access year round, great investment, \$68K cash/obo. Randall.Mielke@fijivillage.com.

Vacation Rentals

BIG BEAR LAKEFRONT, luxury townhome, 2 decks, tennis, pool/spa, beautiful master bd. suite, sleeps 6. 949/786-6548. CAMBRIA, ocean front house, sleeps up to 4, exc. view. 248-8853. CANGUN, time share condo, A Royal Resort, July 6-13, sleeps 6, 2 bd., 2 ba., on North Shore, full kitch., resort offers restaurants, bars, mini-market, 2 pools, tennis, bicycles, sailboats, 18-hole golf course nearby, \$700/wk. 805/577-0990. HAWAII, Kona, ocean front on Keauhou Bay, house and guest house comfortably sleep 6, 3 bd., 2 ba., rustic, relaxing and beautiful, swimming, snorkeling, fishing, spectacular view, near restaurants, golf and other attractions. 626/584-9632. HAWAII, Maui condo, NW coast, ocean front view, 25 ft. fr. surf, 1 bd. w/loft, compl. furn. phone, color TV, VCR, microwave, d/w, pool, priv. lanai, slps 4, laundry fac., 4/15-12/14 \$105/nite/2, 12/15-4/14 \$120/nite/2, \$15/nite/add'l person. 949/348-8047 or jackandrandy@cox.net. MAMMOTH, Snowcreek, 2 bd., 2 ba., + loft, sleeps 6-8, fully equipped kitchen incl. microwave, D/W, cable TV, VCR, phone, balcony w/view to mtns., Jacuzzi, sauna, streams, fishponds, close to Mammoth Creek, JPL discount. 626/798-9222 or 626/794-0455. OCEANSIDE, on the sand, charming 1 bd. condo, panoramic view, walk to pier & harbor, pool/spa, game rm., sleeps 4. 949/786-6548. OCEANSIDE condo, fully furnished, 2 bd., 2 ba., fireplace, full kitchen, quiet, relaxing, beautiful beachside setting; BBQ, pool, spa, game room, great ocean view, easy walk to pier and restaurants; sleeps 6, weekly or monthly. 909/981-7492 or dthauge@yahoo.com, Darlene. PACIFIC GROVE hse, 3 bd., 2 ba., f/p, cable tv/vcr, stereo/CD, well eqpd. kit w/microwv, beaut. furn, close to golf, bches, 17 Mile Dr., Aquarium, Cannery Row, JPL discont. 626/441-3265. ROSARITO BEACH condo, 2 bd., 2 ba., ocean view, pool, tennis, short walk to beach on priv. rd., 18-hole golf course 6 mi. away, priv. secure parking. 626/794-3906. SAN FRAN., elegant Nob Hill honeymoon suite, sleeps 2 max., full kitch., maid service, concierge, reserve early. \$145/nite, \$870/wk. 626/254-1550.